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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/069,656	05/14/2002	Valery Konstantinovich Smirnov	20103/00201	3563

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EXAMINER
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HASSANZADEH, PARVIZ

ART UNIT	PAPER NUMBER
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1763

DATE MAILED: 03/24/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/069,656

Applicant(s)

SMIRNOV ET AL.

Examiner

Parviz Hassanzadeh

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 25 February 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 4-8 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 4-8 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☒ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 2/02.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Oath/Declaration*

It does not state that the person making the oath or declaration has “reviewed and understands the contents of the specification, including the claims, as amended by any amendment” specifically referred to in the oath or declaration.

### *Claim Rejections - 35 USC § 112*

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 4-8 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships are: in claim 4, it is not clear whether the ion producing arrangement controlling energy, the ion current meter, the mass separator, and the ion beam transport column are components of an ion beam source. The structural relationship between electron gun with respect to the optical microscope is also missing

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various

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claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

**Claims 4-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gerlach et al (US Patent No. 6,414,307 B1) in view of Ono et al (US Patent No. 5,343,047) and Ohnishi et al (US Patent No. 5,120,925).**

Gerlach et al teach a system (Fig. 1) for processing a sample (for forming nanostructure on a surface of a semiconductor wafer), the system comprising:

a vacuum chamber 26 having exhaust system 30 and stage 24 which can be heated (annealing system);

a door 60 is opened for inserting sample 22 on stage 24 which can be heated (an input device inputting a semiconductor wafer into the vacuum chamber);

an ion beam generator 29 including a high voltage power supply 34 (an ion beam source arrangement controlling energy of ions); a deflection controller and amplifier 36 for controlling ion beam 18 (an ion current meter); an ion beam focusing column 16 (an ion beam transport column);

a scanning electron microscope (SEM) 43 including an electron beam generator 41 that can be used to view the results of operations by the ion beam 18 or to perform electron beam processing (an optical microscope; an electron gun);

an electron multiplier 40 for detecting secondary emission for imaging (an electron detector receiving secondary electrons);

a sample stage 24 for supporting the sample 22 (a holding arrangement for the semiconductor wafer) wherein the stage is an X-Y stage;

a secondary ion mass spectrometer (SIMS) 39 for analysis of elements produced during interaction of the ion beam 18 on the sample surface (a quadrupole mass analyzer) (column 3, line 50 through column 4, line 33; column 7, lines 36-59).

Gerlach et al fail to teach the ion source including a mass separator for separating the ions in the ion beam generator system; and explicitly disclosing a computer for controlling the above recited members of the apparatus.

Ono et al teach an ion implantation system including an ion beam source system having a mass spectrometer 5 for selecting desired ions to be directed to the surface of the sample to be processed (column 4, lines 49 through column 5, line 7).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to implement the ion beam source as taught by Ono et al in the apparatus of Gerlach et al in order to selectively direct desired ions towards the sample to be processed.

Ohnishi et al teach an ion beam processing apparatus (Fig. 2) including a computer 500 in communication with various apparatus members so that the functions of the various parts can be controlled and monitored through the computer (column 3, lines 9-34).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to implement the computer as taught by Ohnishi et al in the apparatus of Gerlach et al in order to control and monitored the operation of the apparatus through the computer.

Further regarding claims 4-6: the ion beam, the optical microscope and the electron gun in the apparatus of Gerlach et al are directed towards the surface of the sample as shown in Fig. 1 and since the ion beam can be deflected by the deflection controller 36 therefore the ion beam, the optical microscope and the electron gun can be directed to a particular point on the surface of the sample. Furthermore rearrangement of the parts is considered to have been obvious to one of ordinary skills in the art at the time of the invention so that the treatment units and the analysis units operate on the same spot on the sample. See *In re Japikse*, 181 F.2d 1019, 86 USPQ 70 (CCPA 1950) (Claims to a hydraulic power press which read on the prior art except with regard to the position of the starting switch were held unpatentable because shifting the position of the starting switch would not have modified the operation of the device.); *In re Kuhle*, 526 F.2d 553, 188 USPQ 7 (CCPA 1975) (the particular placement of a contact in a conductivity measuring device was held to be an obvious matter of design choice).

Further regarding claims 7-8: the recited limitation in these claims are process limitation and the apparatus as discussed above is capable of being operated under the recited conditions.

It has been held that claims directed to apparatus must be distinguished from the prior art in terms of structure rather than function. *In re Danley*, 120 USPQ 528, 531, (CCPQ 1959); “Apparatus claims cover what a device is, not what a device does” (Emphasis in original) *Hewlett-Packard Co. V. Bausch & Lomb Inc.*, 15USPQ2d 1525, 1528 (Fed. Cir. 1990); and a claim containing a “recitation with respect to the manner in which a claimed apparatus is intended to be employed dos not differentiate the claimed apparatus from a prior art apparatus” if the prior art apparatus teaches all the structural limitations of the claim *Ex parte Masham*, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987). Also see MPEP 2114.

***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Swanson et al (US Patent No. 5,376,791) teach an ion beam processing apparatus wherein an ion beam source including a mass spectrometry for performing elemental analyzing;

Azuma et al (US Patent No. 5,976,328) teach an ion beam processing apparatus including a load lock chamber coupled to the ion beam processing chamber through a gate valve.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Parviz Hassanzadeh whose telephone number is (571)272-1435. The examiner can normally be reached on Tuesday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory Mills can be reached on (571)272-1439. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

*P. Hassanzadeh*  
Parviz Hassanzadeh  
Primary Examiner  
Art Unit 1763

March 16, 200